Instructions for Operating

LIONEL AUTOMATIC ACCESSORIES

No. 151 SEMAPHORE
No. 152 CROSSING GATE
No. 153 BLOCK SIGNAL
No. 45N GATEMAN

USING NO. 153C CONTACTOR

Several Lionel accessories, including No. 151 Semaphore, No. 152 Crossing Gate, No. 153 Block Signal, No. 45N Gateman and others, can be operated automatically by the weight of a passing train. This is accomplished through the use of the No. 153C Contactor, one of which is furnished with every automatic accessory.

The No. 153C Contactor is an electrical switch of the "single pole, double throw" type which is placed underneath the track in such a way that it is operated by the weight of the train. Its action is shown in the diagram in Figure 1. Normally, that is when there is no weight on the Contactor, clip No. 3 makes an electrical contact with clip No. 1. When the weight of the train depresses the Contactor, clip No. 3 breaks contact with clip No. 1 and makes contact with clip No. 2 instead.

In addition to operating automatic accessories the No. 153 Contactor can be used to control two trains running on one track, for automatic resetting of switches, and in many other ways which your ingenuity may suggest.

INSTALLING THE CONTACTOR

Slide the Contactor beneath the track so that one of the track ties rests firmly upon the top contact plate. Any Lionel tubular track except "OO" Gauge can be used. Do not fasten down track for several sections on either side of contactor since the track must remain sufficiently flexible to bend under the weight of the train. For the same reason the Contactor may not work satisfactorily when placed underneath a track section immediately adjoining a track switch.

The Contactor has no electrical connections to the track itself. After it is located in the layout it must be connected to the transformer and to the accessory it is intended to operate.

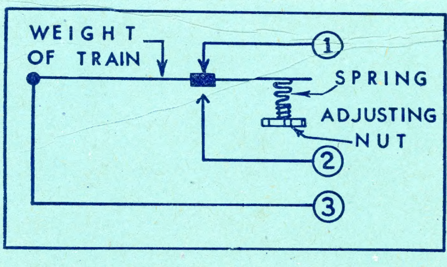

Figure 1—Diagram of the 153C Contactor

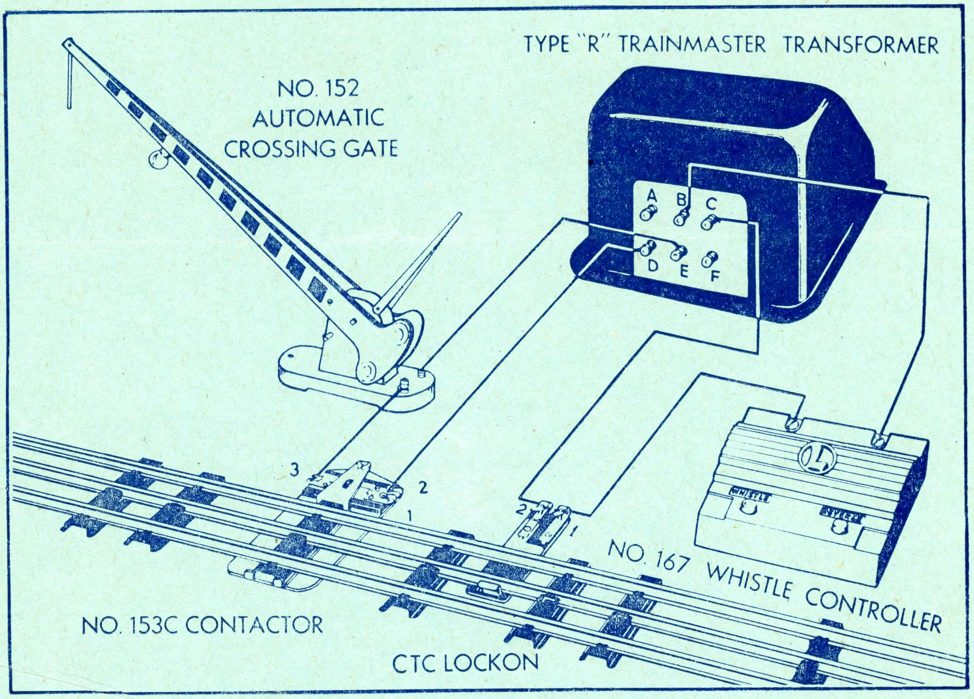

Figure 2—Connections for a No. 152 Crossing Gate. Notice that the Accessory Circuit is Separate from the Track Circuit. No. 45N Watchman is Connected in the same Way.

CONNECTIONS FOR NO. 152 CROSSING GATE AND NO. 45N AUTOMATIC WATCHMAN

To operate No. 152 Crossing Gate or the No. 45N Watchman connect No. 2 clip of the Contactor to one of the pair of transformer output binding posts supplying power for the accessory. Connect No. 3 Contactor clip to a terminal of the accessory. By means of a third wire connect the remaining accessory terminal to the second of the pair of transformer binding posts. (See Figure 2). Connected in this way the Contactor acts as a simple "off and on" switch to switch on the accessory circuit when the Contactor is depressed by the weight of a passing train.

Notice that in this case the accessories have no electrical connection to the track and operate on a separate circuit from the track current. In this way the accessories can be supplied with a fixed voltage which is more suitable for their operation than the variable voltage used for controlling train speed.

ADJUSTING THE CONTACTOR

After all connections are made and transformer current is on, the Contactor should be adjusted so that the accessory will operate only at the proper time. With the train stopped on the track several sections away from the Contactor so that no pressure is exerted on the Contactor, turn the adjustment nut either up or down until the accessory operates. Then back up the adjustment nut just enough to cause the contactor to open and the accessory to return to its normal non-operating position. Adjusted in this way the Contactor should now respond to a light pressure on the track and the accessory will operate as long as any part of the train is passing over the Contactor.

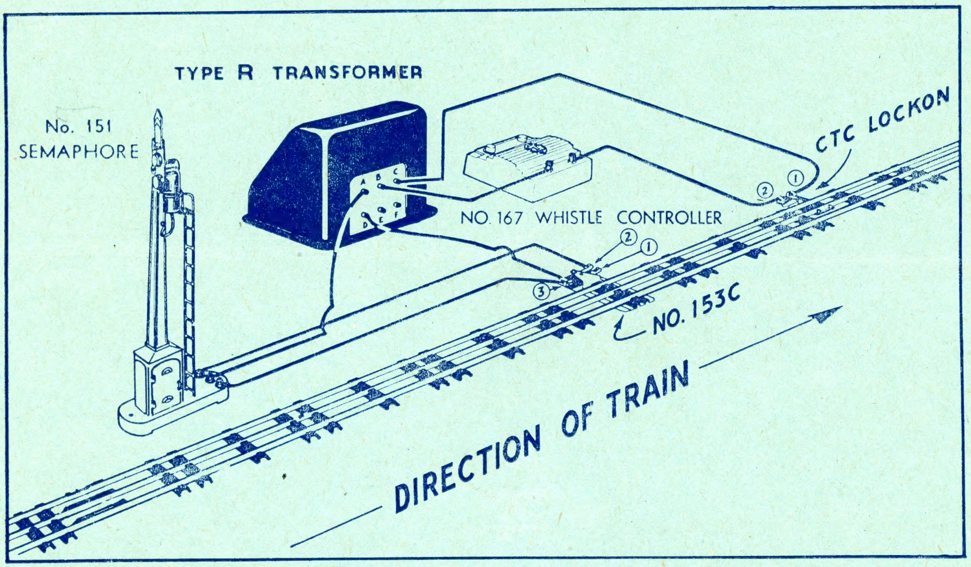

Figure 3—Connections for a No. 151 Semaphore. The Semaphore is Connected to a Pair of Constant Voltage Terminals While the Track is Connected to Variable Voltage Terminals.

CONNECTIONS FOR NO. 151 SEMAPHORE

To connect the No. 151 Semaphore follow the wiring in Figure 3. The middle post of the Semaphore is connected to one of the transformer binding posts. The other transformer post is connected to No. 3 Contactor clip. The same No. 3 clip is connected to that Semaphore post which will cause the Semaphore lamp to light. The last Semaphore post is now connected to Contactor clip No. 2. When correctly adjusted, according to procedure described before, the Semaphore arm should lower when the train is passing over the Contactor. The Semaphore light, however, will remain on all the time, shining either through the red or green lens depending on the position of the Semaphore arm. If more convenient in your layout, the lamp terminal of the Semaphore may be connected directly to the transformer instead of the No. 3 Contactor clip.

CONNECTIONS FOR NO. 153 BLOCK SIGNAL

To operate the No. 153 Block Signal, all three Contactor clips are connected so that the Contactor can serve as a "single pole, double throw" switch. The middle terminal of the Block Signal is connected to one of a pair of transformer binding posts. The other transformer binding post is connected to No. 3 clip of the Contactor. The No. 1 and No. 2 Contactor clips are now connected to the outside posts of the Block Signal as shown in Figure 4. With the train stopped on track some distance from the contactor, turn adjustment screw down as far as it will go. If green light in the Block Signal is on, no further adjustment is required. If red light is on, turn the adjustment nut up until the light just changes to green. When the No. 153 Block Signal is properly connected and adjusted its green light will change to red as the train goes over the Contactor and then back to green when the train has passed.

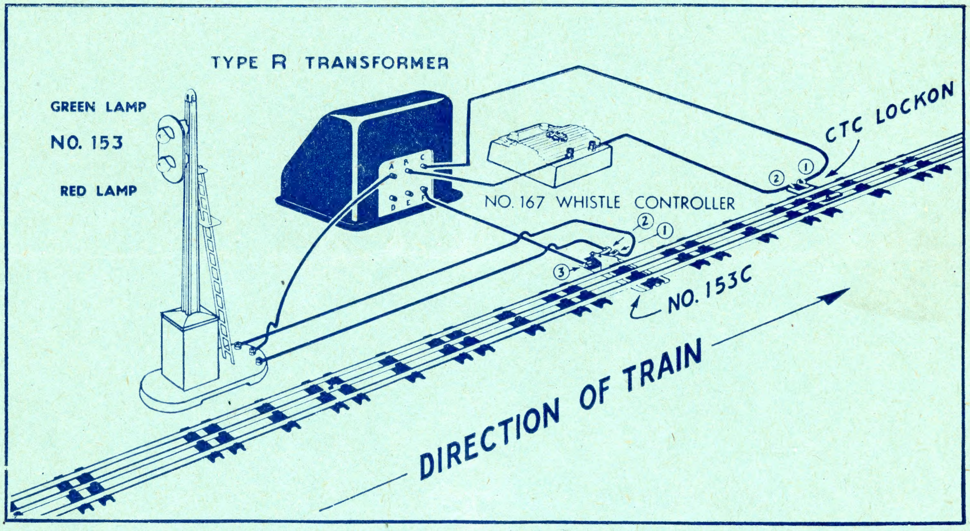

Figure 4—Connections for a No. 153 Block Signal. Diagram Shows How the Accessory May Be Connected to a Pair of Variable Voltage Terminals Adjusted to Correct Voltage.

CONNECTIONS FOR TWO-TRAIN OPERATION

By installing an insulated block and making the connections shown in Figure 5, the No. 153C Contactor can be used to control two trains running simultaneously on the same track and at the same time to operate a Block Signal or a Semaphore which will be synchronized with the movement of trains.

The insulated block is constructed by taking out the metal pins from the middle rail of the end sections of the block and replacing them by insulating fibre pins. Four pins are supplied with each No. 153C Block Signal and No. 151 Semaphore outfit, two for "O" Gauge and two for "0-27" Gauge track. Choose the two which fit your rails. Two Lockons are required for this installation: one, marked "A," in the diagram to furnish power to the insulated section, and the other, marked "B," to make connection with the rest of the track in your layout. Carefully follow the directions as to the minimum number of track sections required. The insulated section should be at least 3 sections long. (Either straight or curved sections may be used.) The larger the layout, the more effective the operation and the less possibility of collisions.

As shown in the diagrams the track and the insulated block operate on separate circuits. The insulated block voltage should be 2 to 3 volts higher than the track voltage so that the train which may be waiting in the insulated block can start rapidly.

It is important that the two trains operate on approximately the same voltage, or the faster train will tend to catch up with the slower train and collide with it before reaching the insulated block. Some of the variation in the speeds of the two locomotives may be compensated for by loading down the speedier train in order to slow it down.

Note: When operating two train layouts don't forget to disconnect the reversing E-Unit in the locomotives so that the train will resume forward motion after being stopped.

To operate two trains with a No. 151 Semaphore, connections are made as indicated in Figure 6. The sequence of train operation will be the same as before and a clear track will be indicated by the lifting of the Semaphore Arm and a flashing of the green Semaphore light.

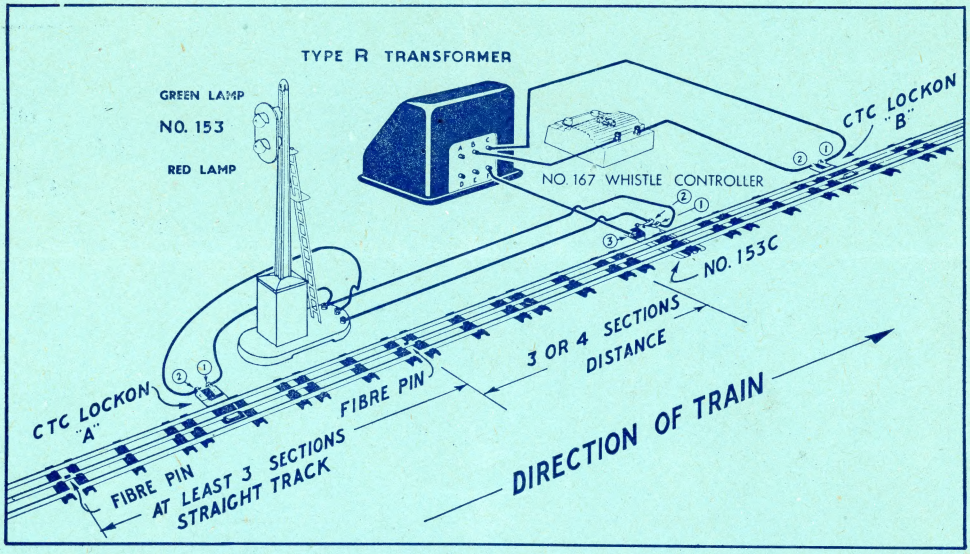

Figure 5—Layout for Operating Two Trains with a Block Control. Notice that Variable Voltage is Supplied to Both Circuits and that the Terminal "B" is Common to Both Circuits.

It is, of course, possible to run two trains on one track without the use of either the Block Signal or the Semaphore. Simply omit the accessory from the layout and connect No. 1 clip of the Contactor to the No. 1 clip of the "A" Lockon.

When these connections are made and the Contactor properly adjusted, the action is as follows: As train No. 1 crosses the Contactor, current is cut out of the insulated block and the Block Signal flashes red. If, at that time, Train No. 2, running behind No. 1, should reach the insulated block it would stop and wait there. As soon as the last car of train No. 1 has passed the Contactor, the Block Signal changes back to green and the current is once

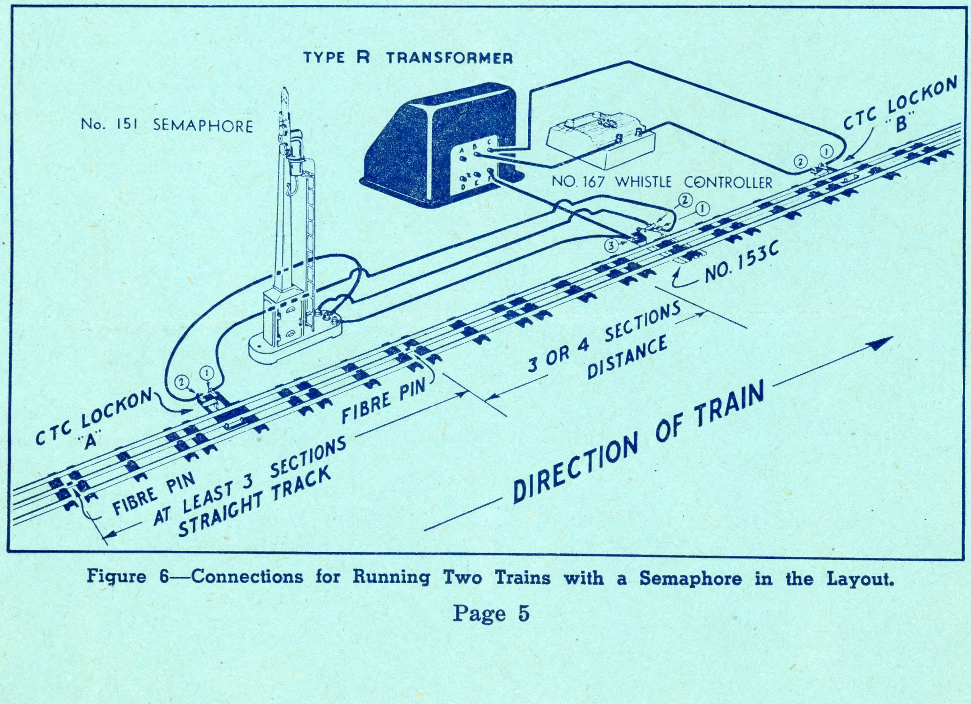

Figure 6—Connections for Running Two Trains with a Semaphore in the Layout.

more switched into the insulated section enabling the waiting train No. 2 to start up again. Of course, if the second train had not yet reached the insulated block it will not stop but will go right through.

TWO-TRAIN LAYOUTS

Two of the many possible layouts using No. 153C Contactor for operating two trains on the same track are shown in Figure 7. The proper connections to various transformers in order to obtain a higher voltage for the insulated block are indicated in the lower right hand corner of the diagrams. Connections for type "A" Trainmaster Transformer and the type "S" Multi-Control Transformer are not shown since these two transformers are not suitable for this type of operation because of too great a difference between their two available voltage ranges.

If you have an "A" or an "S" transformer, you must use a separate small transformer to supply power to the insulated block. If two transformers are used make sure that they are "in phase" so that their high and low voltage alternations coincide. If you find that the two transformers oppose each other, simply reverse the wall plug of one of them.

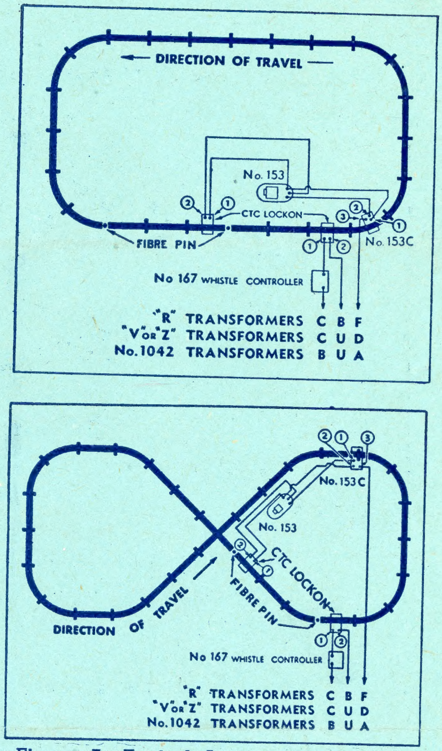

Figure 7—Typical Layouts for Running Two Trains on One Track. Notice the Connections to Various Lionel Transformers.

SERVICE INFORMATION

This equipment was thoroughly inspected before it left the factory and is in perfect condition. Please do not tamper with the mechanism and you will enjoy it for a long time.

If at some future time it requires repairs, send it to the Factory Service Department or to your nearest Lionel Authorized Service Station. Be sure to pack the articles carefully to avoid damage while in transit. Use the original box if you have it. Then place it in another corrugated box or strong container. A letter in a stamped envelope stating fully the repairs you wish to be made *must be pasted to the outside wrapper* since the Post Office regulations do not permit a letter to be placed inside the package.

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